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## Research article

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# A mountain of millipedes V: three new genera of Odontopygidae from the Udzungwa mountains, Tanzania (Diplopoda, Spirostreptida, Odontopygidae)

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**Abstract.** Three new genera of Odontopygidae are described, all based on new species from the Udzungwa mountains, Tanzania, and all monotypic: *Casuariverpa* gen. nov. (type species: *C. scarpa* gen. et sp. nov.), *Yia* gen. nov. (type species: *Y. geminispina* gen. et sp. nov.), and *Utiliverpa* gen. nov. (type species: *U. decapsulatrix* gen. et sp. nov.). Similarities and differences between the new genera and other genera are discussed.

**Keyword.** Eastern Arc, taxonomy, new genera, new species.

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## Introduction

This is the fifth in a series of articles about the millipedes, especially the endemic Afrotropical family Odontopygidae, of the Udzungwa Mountains, Tanzania. For general information on the Odontopygidae and the Udzungwa Mountains see the first article in the series (Enghoff 2014). See also Enghoff & Frederiksen (2015) and Enghoff (2016a, 2016b).

In the present contribution, three new, monotypic genera and their type species are described.

## Material and methods

The material for this article comes mostly from the zoological collections of the Natural History Museum of Denmark, University of Copenhagen (ZMUC). These specimens were collected during field trips by ZMUC staff and students. A specimen from Virginia Museum of Natural History (VMNH) was also examined. All specimens are kept in 70% alcohol.

Specimens were examined in alcohol under a stereo microscope. Specimens for scanning electron microscopy (SEM) were transferred to 96% ethanol, then to acetone, air-dried, mounted on aluminium

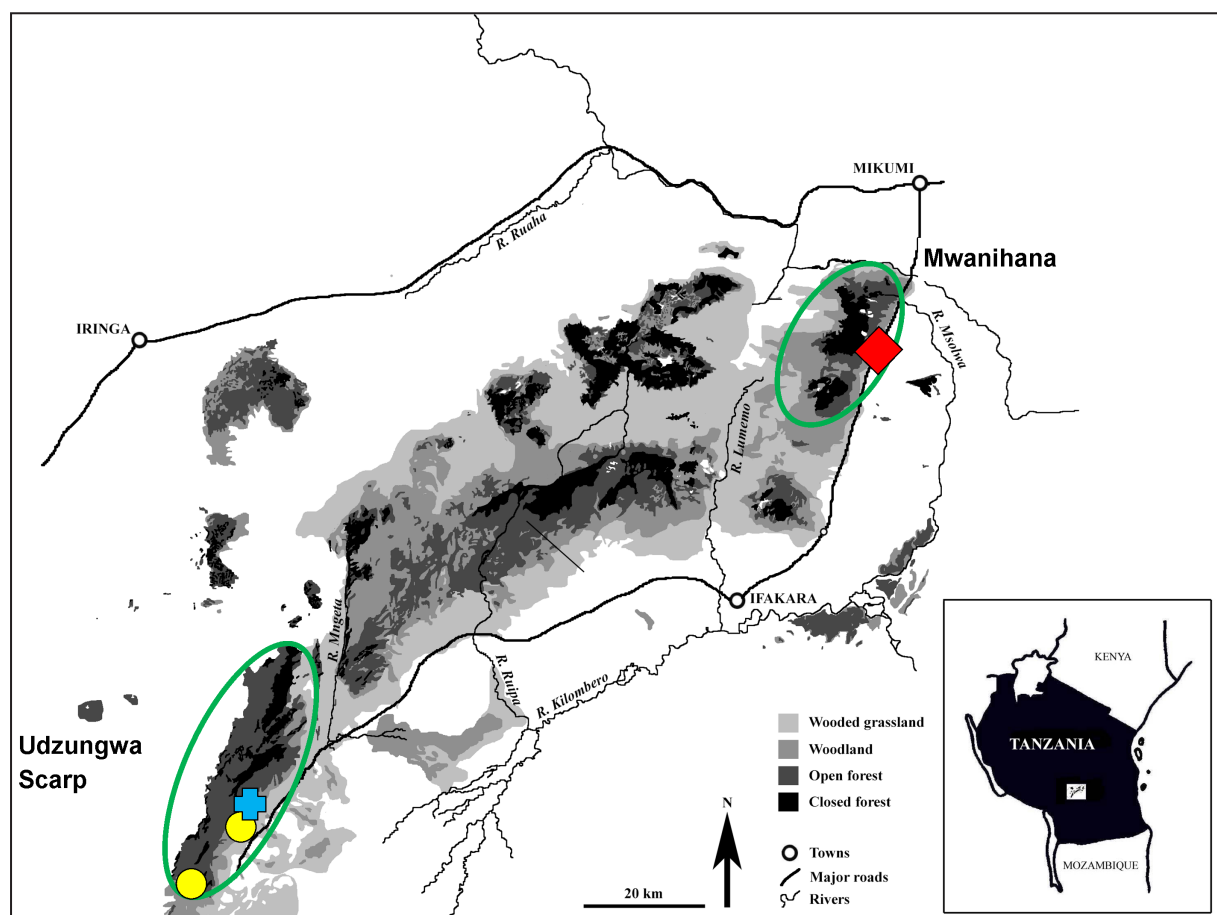
stubs or on pieces of flexible aluminium tape and in turn mounted on stubs, coated with platinum-palladium and studied in a JEOL JSM-6335F scanning electron microscope.

As in previous articles in this series, only adult males are considered. A total of 14 adult males of the three new species were examined. Fig. 1 shows the Udzungwa localities where the new species described here were collected. Fig. 2 gives the body size (body diameter/number of podous rings) of males of the new species.

See Enghoff (2014) for the description standards used.

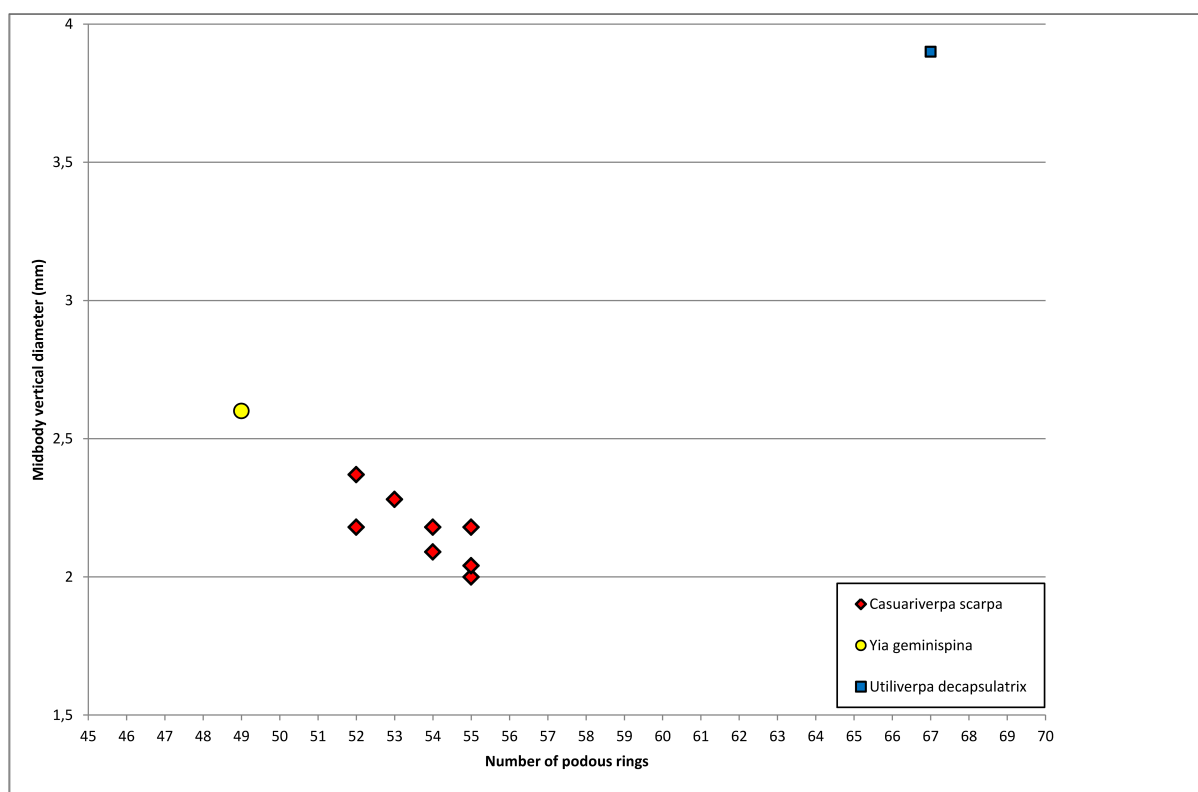
#### Abbreviations for morphological terms used in the descriptions and on illustrations

<i>all</i>	= apical lateral lobe of coxa
<i>ba</i>	= basomere
<i>cu</i>	= cucullus
<i>eg</i>	= efferent groove
<i>lp</i>	= lateral coxal process



**Fig. 1.** Map of the Udzungwa Mountains, showing the collecting localities for *Casuariverpa scarpa* gen. et sp. nov. (yellow dots), *Yia geminispina* gen. et sp. nov. (blue cross), and *Utiliverpa decapsulatrix* sp. nov. (red diamond). Based on fig. 1 in Marshall *et al.* (2010).

<i>mbp</i>	= metapical bifid process
<i>mf</i>	= metapical flange
<i>mp</i>	= metaplica
<i>ms</i>	= metapical shelf
<i>msh</i>	= metapical spine
<i>pn</i>	= posttarsal narrowing
<i>pp</i>	= proplica
<i>prl</i>	= proplical lobe
<i>ps</i>	= proximal solenomer spine.
<i>slm</i>	= solenomere
<i>tdp</i>	= telomer distal process
<i>tf</i>	= telomer furrow
<i>tlm</i>	= telomere
<i>tr</i>	= telomer ridge
<i>ts1, ts2</i>	= telomer spines
<i>tss</i>	= telomer subapical spike
<i>tt</i>	= torsotope



**Fig. 2.** Body size (body diameter/number of podous rings) of males of the new species described here.



## Results

Class Diplopoda Blainville-Gervais, 1844  
Order Spirostreptida Brandt, 1833  
Family Odontopygidae Attems, 1909  
Subfamily Archepyginae Manfredi, 1939  
Tribe Prionopetalini Hoffman, 1991

*Casuariverpa* gen. nov.

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### Type species

*Casuariverpa scarpa* gen. et sp. nov.

### Other included species

None.

### Diagnosis

A genus of Odontopygidae-Prionopetalini characterized by: anal valves with a well-developed dorsal spine, a similarly well-developed ventral spine and strongly protruding setiferous tubercles – male body ring seven with large ventral lobes – limbus very broad, with a simply denticulate margin – ventral postfemoral and tibial pads on some male legs – gonopod coxa simple, metaplica (*mp*) with a subapical basad spine (*msp*) – gonopod telopodite with a compact torsotope (*tt*) – no pretorsal or torsal spines/processes – a pronounced posttorsal narrowing (*pn*) without spines – a division of the telopodite into solenomere (*slm*) and telomere (*tlm*) immediately distal to posttorsal narrowing – solenomere whiplike, with a very long accessory spine (*ps*) branching off near its base and with a small subdistal lobe – telomere simple, with a longitudinal ridge on concave side enveloping solenomere, distally expanded, with micro-spinose fields basally and distally.

### Etymology

From Latin *Casuarina*, “cassowary”, and “*verpa*”, penis. Refers to the shape of the solenomere tip which is somewhat reminiscent of the head profile of the Australian cassowary (*Casuarus casuarus* (Linnaeus, 1758)). Gender feminine.

### Remarks

In the key of Kraus (1966), *C. scarpa* gen. et sp. nov. runs to *Trichochaleponcus* Attems, 1928 (couplet 21). The key character for this genus is the very broad limbus (which is, however, paralleled in certain other odontopygids, e.g., *Kompsoprium firnosum* Kraus, 1960 (Kraus 1960: fig. 69)). *Casuariverpa scarpa* gen. et sp. nov. also agrees with *Trichochaleponcus* species in some other characters, but there are differences enough, at least vis-a-vis the type species of *Trichochaleponcus*, that a new genus is warranted, cf. Enghoff (2016a). Thus, *Casuariverpa* gen. nov. has strongly protruding setiferous tubercles and an exceptionally well-developed ventral spine on the anal valves, its gonopod coxa has no lateral process or spine at mid-length, its gonopod telopodite has no spine between torsotope and posttorsal narrowing, the solenomere has no second basal spine in addition to the very long one, and the telomere is expanded distally instead of being strongly attenuate. See Table 1.

**Table 1.** (continued on next page) Comparison of *Casuariverpa scarpa* gen. et sp. nov. and *Yia geminispina* gen. et sp. nov. with *Trichochaleponcus* Attems, 1928 and its constituent species. Information on *Trichochaleponcus* taken from the cited papers.

Character	<i>Casuariverpa scarpa</i> gen. et sp. nov.	<i>Trichochaleponcus</i> general – (Kraus 1960)	<i>T. fissicirratu</i> – (Attems 1914) (type species)	<i>T. spinifer</i> – (Attems 1938)	<i>T. lomelaensis</i> – (Kraus 1960)	<i>Yia geminispina</i> gen. et sp. nov.
<b>NON-GONOPOD CHARACTERS</b>						
<b>anal valves, marginal ridge</b>	not separated from median margin	separated from median margin by deep depression	separated from median margin by depression	not separated from median margin	separated from median margin by shallow depression	not separated from median margin
<b>anal valves, setiferous tubercles</b>	protruding in lateral view	no info	forming “ravelins”	no info	no info	forming small “ravelins”
<b>anal valves, dorsal spine</b>	very big	no info	very stout	no info	present	big
<b>anal valves, ventral spine</b>	very big	no info	absent	no info	absent	absent
<b>limbus</b>	very broad, margin divided into narrow, blunt- triangular processes	very broad, divided into simple processes which in <i>fissicirratu</i> s are each divided again into 2–6 processes	quite broad, margin with simple, narrow points	very broad, margin divided into 2–6-cusped processes	unusually broad, margin divided into simple, pointed- ligulate processes	very narrow, margin with simple, narrow points
<b>GONOPOD COXA</b>						
<b>with a lateral spine/process ca at midlength</b>	no	yes	yes	yes	yes	no
<b>metaplica with basal/mesad oral process</b>	yes	yes	yes	yes	yes	yes
<b>GONOPOD TELOPODITE</b>						
<b>posttarsal, pre-narrowing spine</b>	no	platelike, expanded	very short, blunt	no (?)	platelike, expanded	no
<b>solenomere with long side- branch  (“Tibialdorn”)</b>	yes	yes	yes	yes	yes	yes
<b>solenomere also with second basal spine  (“Tibialdorn”)</b>	no	yes	yes	no (?)	yes	yes

Character	<i>Casuariverpa scarpa</i> gen. et sp. nov.	<i>Trichochaleponcus</i> general – (Kraus 1960)	<i>T. fissicirratu</i> – (Attems 1914) (type species)	<i>T. spinifer</i> – (Attems 1938)	<i>T. lomelaensis</i> – (Kraus 1960)	<i>Yia geminispina</i> gen. et sp. nov.
<b>solenomere with small subdistal process/tooth</b>	yes	no info	no info	no	yes	no
<b>telomere distally</b>	expanded, distal margin straight	no info	strongly attenuate, ending in very thin, microtrichose tip	strongly attenuate, ending in very thin tip	strongly attenuate, ending in spinelike tip	strongly attenuate, ending in very thin tip
<b>telomere with microtrichose/- spiculose area</b>	basally and distally	yes	distally	basally and distally	distally	no

*Casuariverpa scarpa* gen. et sp. nov.

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Figs 3–4

## Diagnosis

(redundant, genus monotypic)

## Etymology

The name is a noun in apposition and refers to the Udzungwa Scarp Forest Reserve.

**Material studied** (total: 12 ♂♂)

### Holotype

TANZANIA: ♂, Udzungwa Mts, Iringa Region, Udzungwa Scarp Forest Reserve above Chita village, 1050 m, 26–29 Oct. 1984. Pitfall traps in intermediate rain forest, N. Scharff leg. (ZMUC00046998).

### Paratypes

TANZANIA: 7 ♂♂, same data as holotype (ZMUC00046999); 4 ♂♂ Udzungwa Mts, Kihansi, 8°24' S, 36°21' E, “forest site”, Jun.–Aug. 1997, I. Zilihona leg. (ZMUC00047000).

## Description (male)

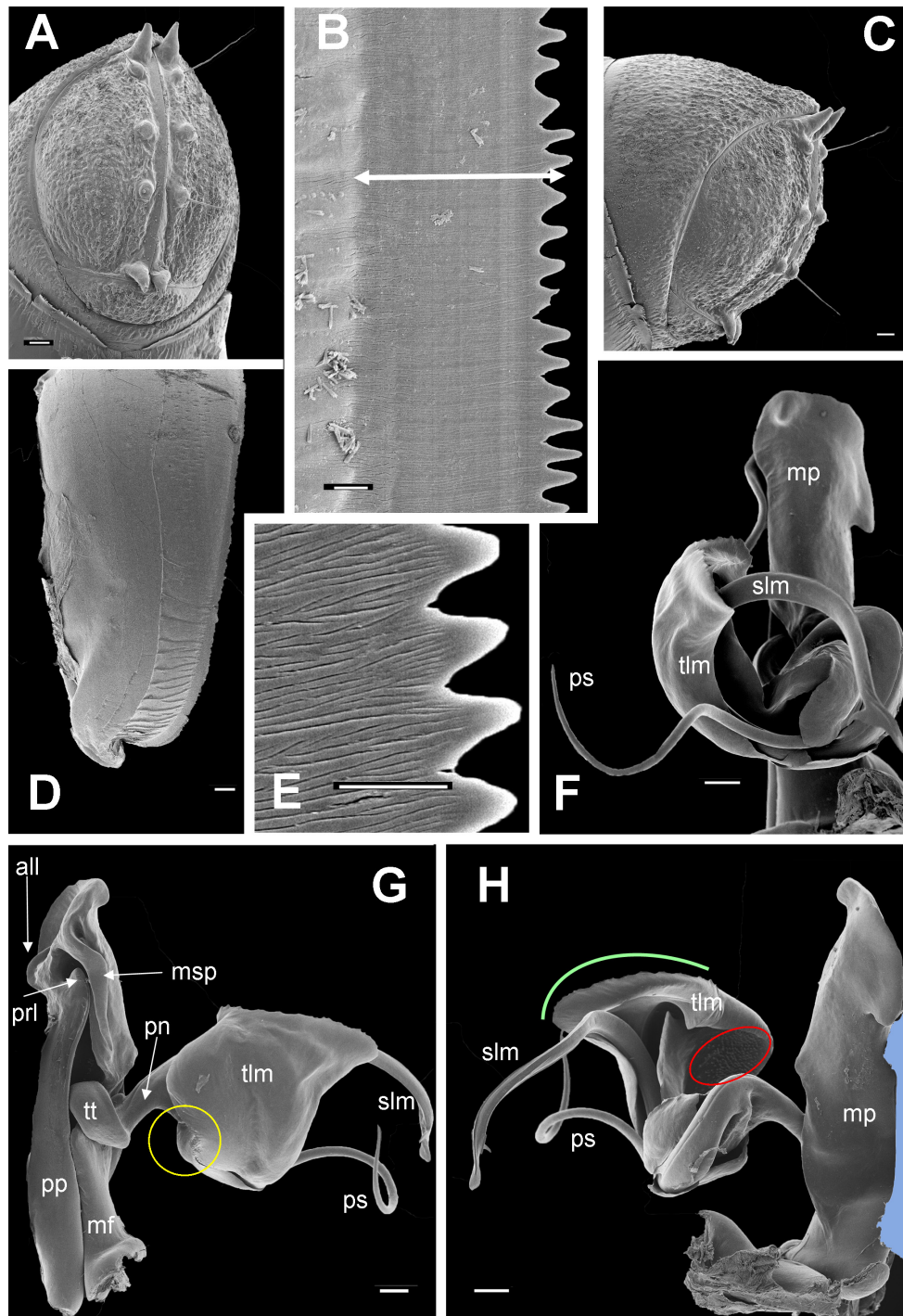
**SIZE.** Length ca 2½–3 cm, diameter 2.0–2.4 mm, 52–55 podous rings, no apodous rings in front of telson.

**COLOUR.** Faded; traces of a broad, light dorsal stripe.

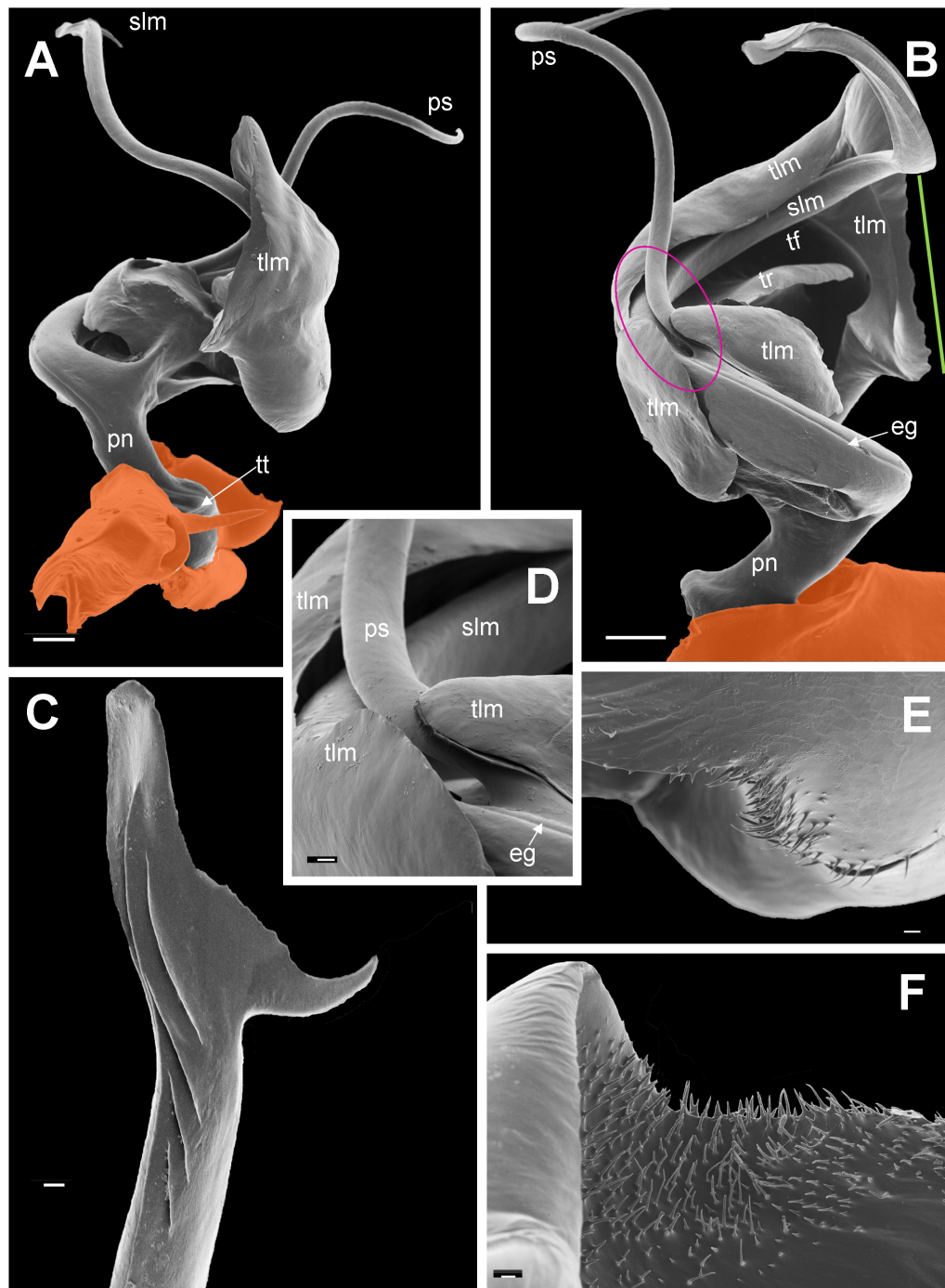
**HEAD.** Without peculiarities.

**COLLUM.** With a marginal and ~3 submarginal furrows.

**BODY RINGS.** Almost perfect cylinders, not vaulted; suture straight; ozopores ca three diameters behind suture.



**Fig. 3.** *Casuariverpa scarpa* gen. et sp. nov., paratype from Udzungwa Scarp Forest Reserve above Chita village. **A, C.** Telson. **A.** Posterior view. **C.** Lateral view. **B.** Limbus, the double-headed arrow indicates the extent of the limbus. **D.** Body ring 7, left lateral view. **E.** Detail of limbus to show microstriolation. **F–G.** Left gonopod. **F.** Mesal view. **G.** Anterior view, the yellow circle indicates the position of the microspinose field shown in Fig. 4E. **H.** Posterior view, the red oval indicates the position of the microspinose field shown in Fig. 4E, the green line indicates the distal margin of the telomere; blue colour = mounting tape. Abbreviations: *all* = apical lateral lobe of coxa, *mf* = metapical flange, *mp* = metaplica, *msp* = metaplical spine, *pn* = post-torsal narrowing, *pp* = proplica, *prl* = proplical lobe, *ps* = proximal solenomeral spine, *slm* = solenomere, *tlm* = telomere, *tt* = torsotope. Scales: A, C–D, F–H = 0.1 mm; B, E = 0.01 mm.



**Fig. 4.** *Casuariverpa scarpa* gen. et sp. nov., paratype from Udzungwa Scarp Forest Reserve above Chita village, left gonopod telopodite. **A.** Apical view, coxal parts in orange colour. **B.** Basal view, purple oval roughly corresponds to Fig. 4D, coxal parts in orange colour, the green line indicates the distal margin of the telomere. **C.** Tip of solenomere. **D.** Origin of proximal solenomeral spine (*ps*) between two basal lobe of telomere (*tlm*), image roughly corresponding to purple oval on Fig. 4B. **E.** Micro-spinose field on basal external side of telomere basis, image roughly corresponding to area in yellow circle on Fig. 3G. **F.** Micro-spinose field on distal part of telomere concavity, image roughly corresponding to area in red oval on Fig. 3H. Abbreviations: *eg* = efferent groove, *pn* = post-torsal narrowing, *ps* = proximal solenomeral spine, *slm* = solenomere, *tf* = telomeral furrow, *tlm* = telomere, *tr* = telomeral ridge *tt* = torsotop. Scales: A–B = 0.1 mm; C–F = 0.01 mm.



ANAL VALVES (Fig. 3A, C). Surface, like that of preanal ring and subanal scale, coarsely rugose. Each valve with a long dorsal spine and an almost as long downwards curved ventral spine; marginal rim barely raised, setiferous tubercles strongly protruding in lateral view, but not protruding in a laterad direction.

OZOPORES. Starting from ring 6.

LIMBUS (Fig. 3B, E). Very broad, with simple, rounded-triangular lobes, surface densely microstriolate.

MALE LEGS. With postfemoral and tibial ventral pads in anterior body half, except on first few leg-pairs.

BODY RING 7 (Fig. 3D). With large ventral lobes, much larger than usual in the family.

GONOPOD COXA (Fig. 3F–H). Slender in anterior view, almost parallel-sided except apically where it has a blunt-triangular lateral expansion (*all*), giving the coxal tip a sub-triangular outline. Proplica (*pp*) simple, proplical lobe (*prl*) not covered by metaplica. Metaplica (*mp*) with large flange (*mf*) reaching to level of arcus, distal to arcus closely appressed to proplica, subdistally with a long, slightly sinuous basad spine (*msp*).

GONOPOD TELOPODITE (Figs 3F–H, 4). Arcus ca 90°. Torsotop (*tt*) simple, compact, without processes, partly hidden inside coxal cavity, i.e., the part of the telopodite between arcus and torsotop extremely short. Posttarsal narrowing (*pn*) without processes or spines. Telopodite just distal to posttarsal narrowing dividing into solenomere and telomere. Solenomere (*slm*) long, whiplike, longer than telomere, with a very long accessory spine (*ps*) branching off near its base; tip of solenomere with a curved, triangular-pointed lobe giving the tip a profile somewhat similar to that of a cassowary (see etymology). Telomere (*tlm*) proximally enveloping base of solenomere, distally expanded, all in all forming a roughly triangular concave plate; concavity with a longitudinal ridge (*tr*) delimiting a broad furrow (*tf*) for accommodation of solenomere; distal margin of telomere straight, gently undulate. A micro-spinose field on basal external side of telomere basis (Figs 3G, 4E), another micro-spinose field (Figs 3H, 4F) on distal part of telomere concavity.

### Distribution and habitat

Known only from the two sites in and adjacent to the Udzungwa Scarp Forest Reserve, Udzungwa Mts.

### Coexisting species

*Aquattuor stereosathe* Enghoff, 2015 was found in the same sample from above Chita as *C. scarpa* gen. et sp. nov. In addition, *A. udzungwensis* Enghoff, 2015, *Chaleponcus circumvallatus* Enghoff, 2014, *C. hamerae* Enghoff, 2014, *C. nikolajschaffi* Enghoff, 2014 and *Yia geminispina* gen. et sp. nov. occur in the Udzungwa Scarp Forest Reserve. At Kihansi, *Prionopetalum asperginis* Enghoff, 2016 was found in the same sample as *C. scarpa* gen. et sp. nov.

*Yia* gen. nov.

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### Type species

*Yia geminispina* gen. et sp. nov.

### Other included species

None.

### Diagnosis

A genus of Odontopygidae-Prionopetalini characterized by: a metaplical shelf (*ms*) with a curved spine (*msh*) on the coxa (shared with the *Chaleponcus dabagaensis* group, see Enghoff 2014) – a compact torsotop ( *tt*) – lack of pretorsal or torsal spines/processes – a pronounced posttarsal narrowing (*pn*) without spines – a division of the telopodite into solenomere (*slm*) and telomere (*tlm*) immediately distal to posttarsal narrowing – a pair of long spines (*ts1*, *ts2*) emerging from the base of the telomere – a slender, whiplike solenomere – a very long, slender distal telomeral process (*tdp*) with a row of long Y- or I-shaped spikes along one edge and an extensively spinose tip.

### Etymology

The name is an artificial word and refers to the row of Y- and I-shaped spikes on the gonopod telomere (Fig. 6F). To be treated as feminine.

### Remarks

In the key of Kraus (1966) *Y. geminispina* gen. et sp. nov. runs to *Odontopyge* Brandt, 1841. As explained by Hoffman (1991) and Enghoff (2016a) this name has been misapplied, and species classified in *Odontopyge* by pre-1991 authors need to be re-allocated. This is an ongoing process, but the type species of *Yia* gen. nov. cannot be accommodated in any of the genera which have so far absorbed former *Odontopyge* species (see Enghoff 2016a). I therefore propose a new genus. None of the still orphaned ex-*Odontopyge* species share the diagnostic characters of *Yia* gen. nov., which thus remains monotypic for the time being. *Geotypodon heteromodelus* (Kraus, 1960) (= *Haplothysanus modestus* Attems, 1953, preoccupied) shares the double telopodital spine characteristic of *Yia* gen. nov., but differs strongly in several other characters including the structure of the telomere. A very long, very slender distal telomeral process is found in some other odontopygids, e.g., all species of *Allantogonus* Attems, 1912 (Kraus 1960) and *Prionopetalum* Attems, 1909 (VandenSpiegel & Pierrard 2009; Enghoff 2016b), but these genera differ from *Yia* gen. nov. in other characters, and no other species has the row of long Y- or I-shaped spikes characteristic of this genus. The metaplical shelf and spine resemble a similar structure in the *Chaleponcus dabagaensis* group (Enghoff 2014), but in *Yia* gen. nov. the spine originates between the shelf and the apical metaplical hood, not from the shelf itself as in the *C. dabagaensis* group. Also the apical metaplical cucullus (*cu*) resembles the *C. dabagaensis* group. *Yia geminispina* gen. et sp. nov. also shows specific similarities with species of the genus *Trichochaleponcus* Attems, 1928: the general shape of the coxa, the presence of two spines originating at the base of the telomere, and the tip of the telomere being drawn out into a slender arm. Notable differences include the limbus which is very narrow in *Yia* gen. nov., very broad in *Trichochaleponcus*, the absence of a posttarsal, pre-narrowing spine as well as of microtrichose areas on the telomere in *Yia*, and the unique Y-shaped spicules on the telomere tip in *Yia*. See also Table 1. The peculiar course of the pro-metazonal suture seen in *Yia geminispina* gen. et sp. nov. has so far not been observed in any other odontopygid.

*Yia geminispina* gen. et sp. nov.

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Figs 5–6

### Diagnosis

(redundant, genus monotypic)

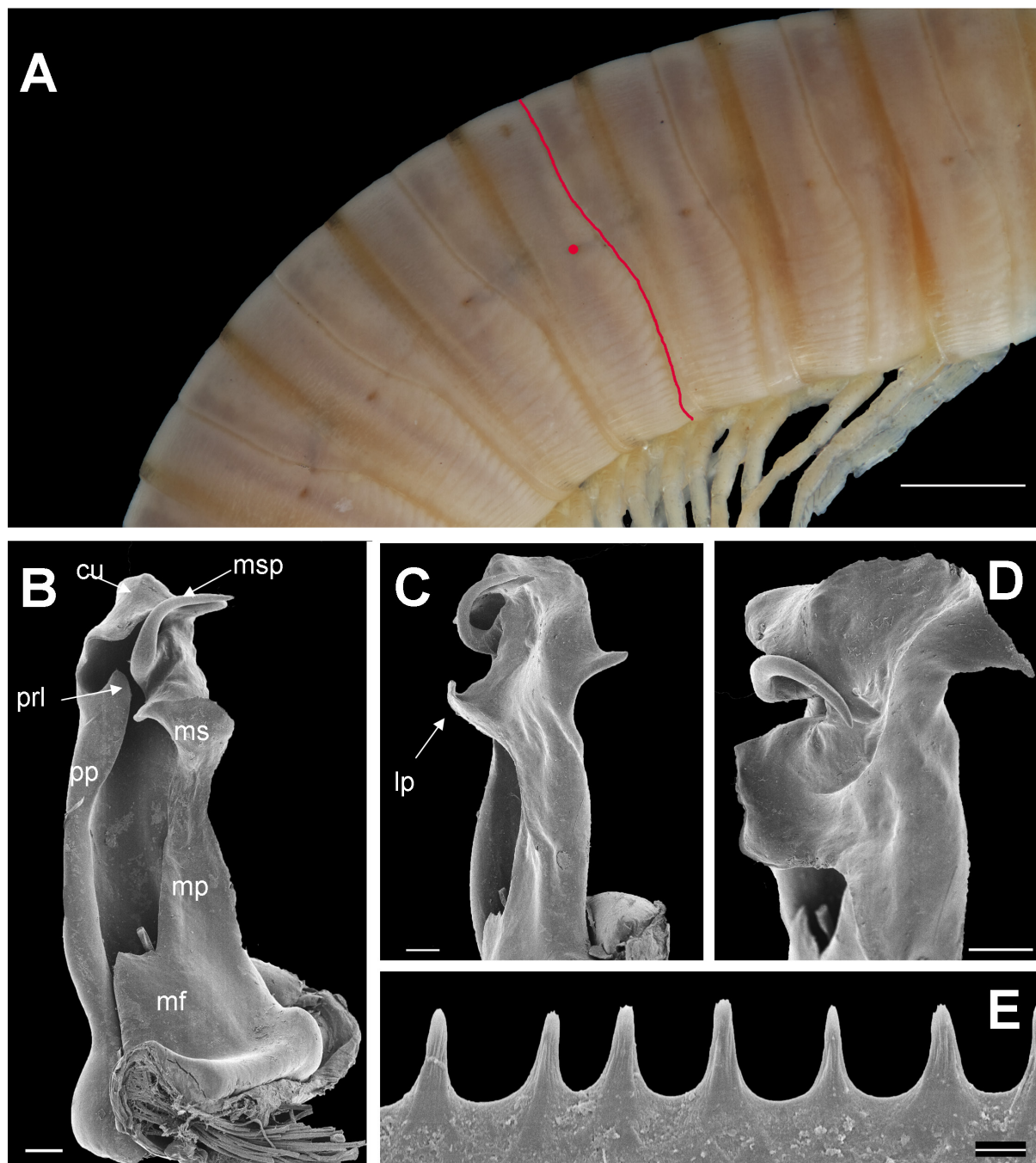
### Etymology

The name is a composite Latin noun in apposition meaning “twin spine” and refers to the pair of long spines on the telomere.

**Material studied** (total: 1 ♂)

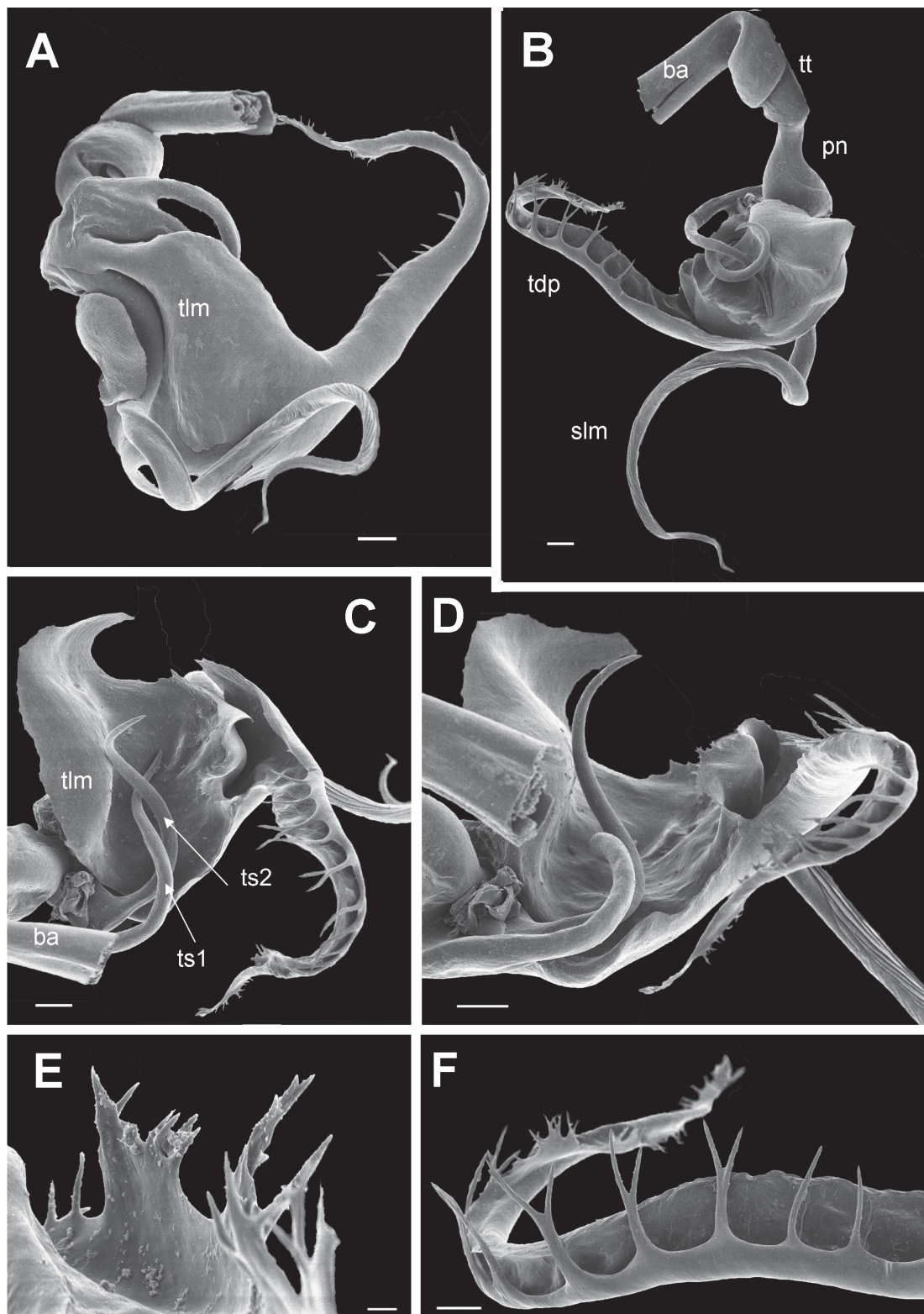
**Holotype**

TANZANIA: ♂, Udzungwa Mts., Chita Forest Reserve [actually: Udzungwa Scarp F.R.], 1100 m, 25 Oct. 1984, M. Stoltze & G. Petersen leg. (ZMUC00047001).



**Fig. 5.** *Yia geminispina* gen. et sp. nov., holotype. **A.** Part of midbody showing the characteristic course of the suture and the position of the ozopore (highlighted in red on one body ring). **B–D.** Left gonopod coxa. **B.** Anterior-mesal view. **C.** Posterior view. **D.** Mesal view, close-up. **E.** Limbus. Abbreviations: *cu* = cucullus, *lp* = lateral coxal process, *mf* = metaplical flange, *mp* = metaplica, *ms* = metaplical shelf, *msp* = metaplical spine, *pp* = proplica, *prl* = proplical lobe. Scales: A = 1 mm; B–D = 0.1 mm; E = 0.005 mm.





**Fig. 6.** *Yia geminispina* gen. et sp. nov., holotype. Left gonopod telopodite. **A.** Posterior, slightly basal view. **B.** Anterior, slightly basal view. **C.** Anterior, slightly basal view. **D.** Basal view. **E–F.** Detail of margin of telomere. **F.** Tip of telomere. Abbreviations: *ba* = basomere, *pn* = post-torsal narrowing, *slm* = solenomere, *tdp* = telomeral distal process, *tlm* = telomere, *ts1*, *ts2* = telomeral spines, *tt* = torsotope. Scales: A–D = 0.1 mm; F = 0.05 mm; E = 0.005 mm.

**Description (male)**

SIZE. Length ca 4 cm, diameter 2.6 mm, 49 podous rings, no apodous rings in front of telson.

COLOUR. Faded, very faint traces of a broad, light dorsal stripe.

HEAD. Without peculiarities.

COLLUM. With a marginal and a submarginal furrow.

BODY RINGS (Fig. 5A). Almost perfect cylinders, not vaulted; suture with an extended, shallow anterior sinus below ozopore level; ozopores ca three diameters behind suture.

ANAL VALVES. Each with a long, curved dorsal spine; marginal rim slightly raised, setiferous tubercles slightly protruding in a laterad direction (i.e., on very small ‘ravelins’).

OZOPORES. Starting from ring 6.

LIMBUS (Fig. 5E). With simple, slender-triangular lobes. Surface of lobes longitudinally microstriate.

MALE LEGS. With postfemoral and tibial ventral pads in anterior half of body, except for first few leg-pairs.

GONOPOD COXA (Fig. 5B–D). Slender and almost parallel-sided in anterior view. Proplica (*pp*) simple, propical lobe (*prl*) not covered. Metaplica (*mp*) with low, right-angled flange (*mf*), above arcus with transverse shelf (*ms*), laterally with triangular process (*lp*), apically forming a small hood, or cucullus (*cu*). A curved spine (*msp*) originating between *ms* and *cu*.

GONOPOD TELOPODITE (Fig. 6). Arcus 90°. Torsotop (*tt*) simple, compact, without processes (Fig. 6B). Posttarsal narrowing (*pn*) without processes or spines. Telopodite just distal to posttarsal narrowing dividing into solenomere and telomere. Solenomere (*slm*) long, simple, whiplike, ca as long as telomere. Proximal part of telomere (*t1m*) roughly broadly triangular; two very long, curved spines (*ts1*, *ts2*) arising from small lobe on basal side of telomere, close to the origin of the solenomere; distal part of telomere drawn out into very long, very slender process (*tdp*), one edge of *tdp* with a row of long, Y- or I-shaped spikes; tip of *tdp* complicated micro-spinose.

**Distribution and habitat**

Known only from the type locality.

**Coexisting species**

No other odontopygids were present in the sample containing the unique holotype, but a number of other species have been recorded from Udzungwa Scarp F.R.: *Chaleponcus circumvallatus* Enghoff, 2014, *C. hamerae* Enghoff, 2014, *C. nikolajschaffi* Enghoff, 2014, *Aquattuor sterosathe* Enghoff, 2015, *A. udzungwensis* Enghoff, 2015, *Prionopetalum asperginis* Enghoff, 20XX and *Casuariverpa scarpa* gen. et sp. nov.

*Utiliverpa* gen. nov.

[urn:lsid:zoobank.org:act:08065174-5A9C-4BFF-8604-653D4FF6D42C](http://urn:lsid:zoobank.org:act:08065174-5A9C-4BFF-8604-653D4FF6D42C)

**Type species**

*Utiliverpa decapsulatrix* gen. et sp. nov.

**Other included species**

None.

### Diagnosis

A genus of Odontopygidae-Prionopetalini characterized by: a long basad metapical spine (*m**sp*) on the anterior side of the coxa – a compact torsotope (*tt*) – lack of pretorsal or torsal spines/processes – a pronounced posttorsal narrowing without spines – a division of the telopodite into solenomere (*slm*) and telomere (*tlm*) immediately distal to posttorsal narrowing – a spine (*ps*) emerging from the base of the solenomere – a ribbonlike solenomere which is accommodated in the concavity of the telomere and which apically is divided into a long hook and a subapical pointed lobe.

### Etymology

From Latin *utilis*: useful, and *verpa*: penis. Refers to the shape of the solenomere which resembles a very useful instrument: a bottle-opener. Gender feminine.

### Remarks

In the key of Kraus (1966) *U. decapsulatrix* gen. et sp. nov. runs to *Rhamphidarpoides* Kraus, 1960. This genus has been a repository for a number of quite different species, but was given a more strict definition by Frederiksen & Enghoff (2015). The new species does not fit the definition of *Rhamphidarpoides* s.s., nor of *Raduliverpa* Frederiksen & Enghoff, 2015, which was erected to accommodate several species formerly assigned to *Rhamphidarpoides*. I therefore propose a new genus here, but leave the question open whether some of the species “orphaned” from *Rhamphidarpoides* by Frederiksen & Enghoff (2015) might belong here.

*Utiliverpa decapsulatrix* gen. et sp. nov.

[urn:lsid:zoobank.org:act:559C22A7-AE92-4633-AB61-788EADDC9AE3](https://zoobank.org/act:559C22A7-AE92-4633-AB61-788EADDC9AE3)

Fig. 7

### Diagnosis

(redundant, genus monotypic)

### Etymology

The name is a Latin noun meaning “remover of capsules”, cf. etymology of genus.

### Material studied (total: 1 ♂)

#### Holotype

TANZANIA: ♂, Morogoro Region, Kilombero District, Udzungwa Mts, Mwanihana Forest Reserve, near Sanje village, under rotten log in forest, K.M.Howell leg., KMH 1686 (VMNH).

### Description (male)

SIZE. Length ca 6 cm, diameter 3.9 mm, 67 podous rings, no apodous rings in front of telson.

COLOUR. Specimen faded, traces of a broad, light dorsal stripe. Colour according to the collector’s field notes: “dark, shiny black with brown stripe length of back; legs pale”.

HEAD. Without peculiarities.

COLLUM. With a marginal and a submarginal furrow.

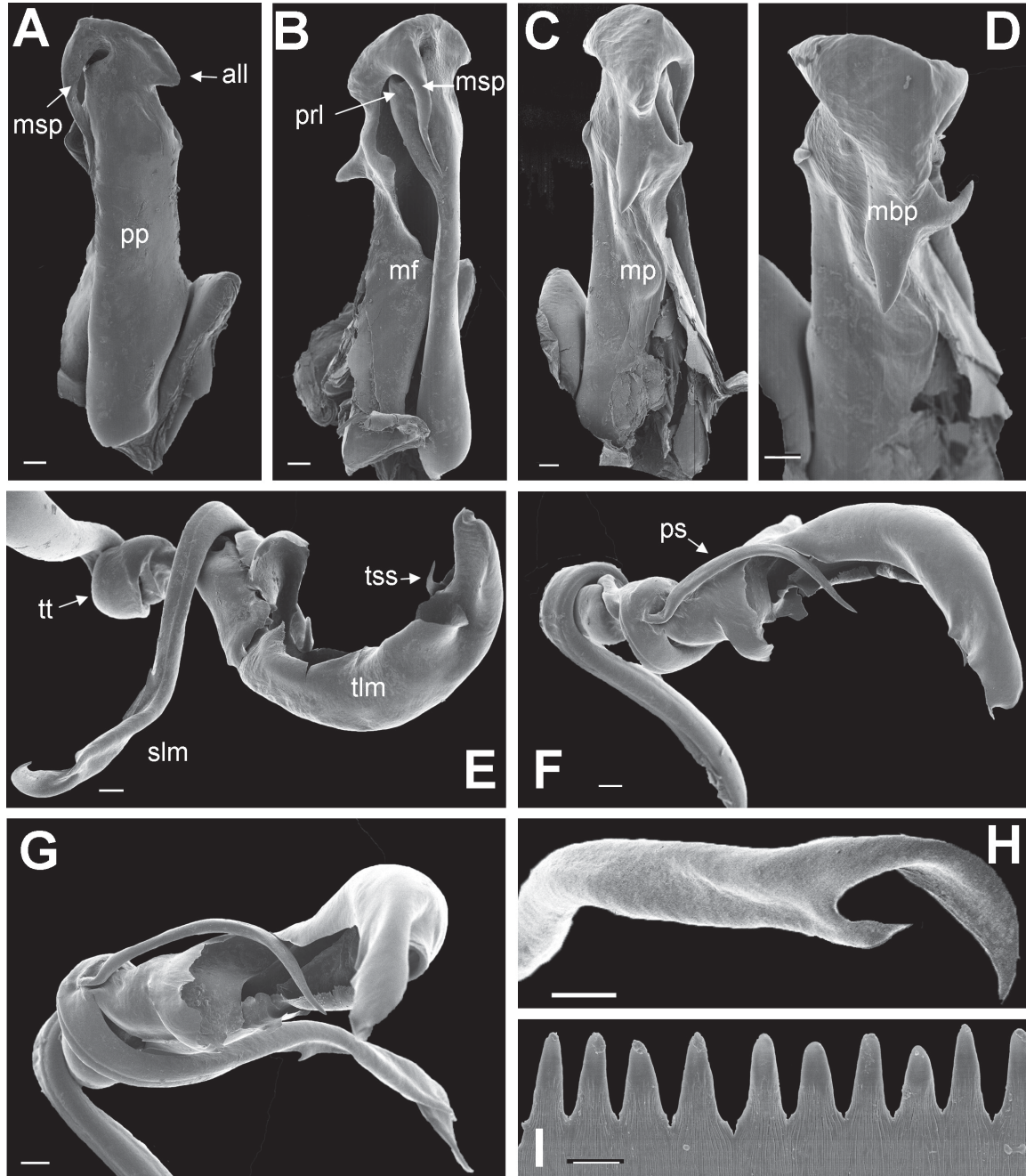
BODY RINGS. Almost perfect cylinders, not vaulted; suture straight; ozopores ca three diameters behind suture.

ANAL VALVES. Each with a short, curved dorsal spine and a small ventral denticle; marginal rim slightly raised, setiferous tubercles hardly protruding.

OZOPORES. Starting from ring 6.

LIMBUS (Fig. 7I). With simple, long-triangular lobes. Surface of lobes longitudinally microstriate.

MALE LEGS. With postfemoral and tibial ventral pads on legs, except a few anteriormost and posteriormost pairs, pads gradually decreasing in size towards posterior end.



**Fig. 7.** *Utiliverpa decapsulatrix* gen. et sp. nov., holotype. **A–D.** Right gonopod coxa. **A.** Anterior view. **B.** Mesal view. **C.** Posterior view. **D.** Posterior-apical view. **E–H.** Left gonopod telopodite. **E.** Anterior view. **F.** Posterior view. **G.** Mesal-anterior-apical view. **H.** Solenomere. **I.** Limbus. Abbreviations: *All* = apical lateral lobe of coxa, *mbp* = metaplical bifid process, *mf* = metaplical flange, *mp* = metaplica, *msp* = metaplical spine, *prl* = proplical lobe, *pp* = proplica, *ps* = proximal solenomeral spine, *slm* = solenomere, *tlm* = telomere, *tss* = telomeral subapical spike, *tt* = torsotope. Scales: A–H = 0.1 mm; I = 0.01 mm.



GONOPOD COXA (Fig. 7A–D). In anterior view parallel-sided, ca 4½ times as long as broad, subapically with a lateral triangular incision delimiting an apical lateral lobe (*all*). Proplica (*pp*) simple, parallel-sided; proplical lobe (*prl*) in anterior view hidden behind metaplical spine. Metaplica (*mp*) apically rounded, with a large mesal flange (*mf*) closing basal part of space between pro- and metaplica, subapically with a long basad spine (*msp*) covering proplical lobe and a stout, bifid process (*mbp*) on posterior surface.

GONOPOD TELOPODITE (Fig. 7E–H). Arculus 90°. Torsotope (*tt*) simple, compact, without processes (Fig. 4B). Posttorsal narrowing without processes or spines. Telopodite just distal to posttorsal narrowing dividing into slender solenomere and broader telomere. Solenomere (*slm*) ca as long as and normally resting within concavity of telomere (projecting perpendicularly on Fig. 7E due to shrinkage during preparation for SEM), simple, apically with a stout hook and a subapical pointed lobe, in profile strongly reminding of a kind of bottle-opener (e.g., <http://www.barleypop.com/best-beer-bottle-opener-period/>). A long, slender, curved spine (*ps*) arising near base of solenomere. Telomere forming a curved, roughly parallel-sided trough, vaguely boat- or pod-shaped, with a subapical spike (*tss*) and several complicated lamellae inside the concavity (Fig. 7G).

### Distribution and habitat

Known only from the type locality. Habitat: forest (under log).

### Coexisting species

No other odontopygid species were found in the same sample as the unique holotype, but three are known from Mwanihana Forest Reserve: *Chaleponcus mwanihanensis* Enghoff, 2014, *Aquattuor major* Enghoff, 2015 and *A. submajor* Enghoff, 2015.

### Discussion

In a previous paper (Enghoff 2016a), I argued that due to the bewildering confusion about genus concepts in Odontopygidae and to the absence of any well-supported hypotheses of relationships within the family, a ‘splitter’ approach will probably serve best, at least at the present stage. This means that a considerable number of narrowly circumscribed genera need to be defined, an agenda already adhered to by, e.g., Frederiksen & Enghoff (2015) and Enghoff (2016a). In the same spirit three new monotypic genera are described in the present paper. Including these, the number of described odontopygid species from the Udzungwa mountains is 33. A few additional species, belonging to (relatively) well-defined, known genera, are known to exist, and ongoing and planned field-work in the Udzungwas will certainly reveal many more.

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### References

- Attems C.G. 1914. *Afrikanische Spirostreptiden nebst Überblick über die Spirostreptiden orbis terrarum*. Zoologica Stuttgart 65–66, Schweizerbart, Stuttgart.
- Attems C. 1938. Diplopoden des Belgischen Congo. Polydesmoidea, 2. Nachtrag und Spirostreptoidea, 1. Nachtrag. *Revue de Zoologie et de Botanique Africaines* 31: 225–313.

- Enghoff H. 2014. A mountain of millipedes I: An endemic species-group of the genus *Chaleponcus* Attems, 1914, from the Udzungwa Mountains, Tanzania (Diplopoda, Spirostreptida, Odontopygidae). *European Journal of Taxonomy* 100: 1–75. <http://dx.doi.org/10.5852/ejt.2014.100>
- Enghoff H. 2016a. A mountain of millipedes III: A new genus for three new species from the Udzungwa mountains and surroundings, Tanzania, as well as several ‘orphaned’ species previously assigned to *Odontopyge* Brandt, 1841 (Diplopoda, Spirostreptida, Odontopygidae). *European Journal of Taxonomy* 177: 1–19. <http://dx.doi.org/10.5852/ejt.2016.177>
- Enghoff H. 2016b. A mountain of millipedes IV: Species of *Prionopetalum* Attems, 1909, from the Udzungwa mountains, Tanzania. With notes on “*P.*” *fasciatum* (Attems, 1896) and a revised species key (Diplopoda, Spirostreptida, Odontopygidae). *European Journal of Taxonomy* 215: 1–23. <http://dx.doi.org/10.5852/ejt.2016.215>
- Enghoff H. & Frederiksen S.B. 2015. A mountain of millipedes II: The genus *Aquattuor* Frederiksen, 2013 – five new species from the Udzungwa Mountains and one from Mt. Kilimanjaro, Tanzania (Diplopoda, Spirostreptida, Odontopygidae). *European Journal of Taxonomy* 150: 1–25. <http://dx.doi.org/10.5852/ejt.2015.150>
- Frederiksen S.B. & Enghoff H. 2015. East African odontopygid millipedes 4: A restricted redefinition of the genus *Rhamphidarpoides* Kraus, 1960, a related new genus, five new species, and notes on solenomere function (Diplopoda; Spirostreptida; Odontopygidae). *Zootaxa* 3926: 541–560. <http://dx.doi.org/10.11646/zootaxa.3926.4.5>
- Hoffman R.L. 1991. What is *Odontopyge*? A solution to a long standing nomenclatorial enigma in the Diplopoda (Spirostreptida Odontopygidae). *Tropical Zoology* 4: 65–73.
- Kraus O. 1960. *Äthiopische Diplopoden I. Monographie der Odontopygidae-Odontopyginae (Diplopoda, Spirostreptoidea)*. Annalen van het Koninklijk Museum van Belgisch-Congo 82, Koninklijk Museum voor Midden Afrika, Tervuren.
- Kraus O. 1966. *Phylogenie, Chorologie und Systematik der Odontopygoideen (Diplopoda, Spirostreptomorpha)*. Abhandlungen der senckenbergischen naturforschenden Gesellschaft 512, Naturmuseum Senckenberg, Frankfurt am Main.
- Marshall A.R., Jørgensbye H.I.O., Rovero F., Platts P.L., White P.C.L. & Lovett J.C. 2010. The species–area relationship and confounding variables in a threatened monkey community. *American Journal of Primatology* 72: 325–336. <http://dx.doi.org/10.1002/ajp.20787>
- VandenSpiegel D. & Pierrard G. 2009. Révision du genre *Prionopetalum* (Odontopygidae, Diplopoda) et descriptions de nouvelles espèces d’Afrique de l’Est. *Journal of Afrotropical Zoology* 5: 149–163.

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